

Work Order # \_\_\_\_\_ Job # \_\_\_\_\_ Activity # \_\_\_\_\_

1. Work requester fills out this section

STANDING WORK PERMIT ☐

Requester: CARTER Biggs Date: 2/25/04 Ext. 7515 Dept/Div/Group: Physics / Phoenix  
Other Contact person (if different from requester): Rob Pisanu Ext. 5301  
Work Control Coordinator CARTER Biggs Start Date 2/26/04 Est. End Date 3/02/04  
Description of Work / Problem: create a SPECIALTY gas mix in a  
compressed gas cylinder of 4.5 to 10 lb, 45% to 50% xenon, and  
10% METHANE

Building 1008 Room 1111 Equipment \_\_\_\_\_ Service Provider \_\_\_\_\_

2. Work requester, service provider, and ES&H (as necessary) fill out this section or attach analysis

**ES&H Analysis**

**RADIATION CONCERNS** ☒ NONE ☐ Activation ☐ Airborne ☐ Contamination ☐ Radiation ☐ OTHER \_\_\_\_\_  
☐ Special nuclear materials involved, notify Isotope Special Materials Group ☐ Fissionable materials involved, notify Laboratory Criticality Officer

**SAFETY CONCERNS** ☐ NONE

<input type="checkbox"/> Adding / Removing Walls or Roofs	<input type="checkbox"/> Confined Space*	<input type="checkbox"/> Explosives	<input type="checkbox"/> Lead*	<input type="checkbox"/> Penetrating Fire Wall
<input type="checkbox"/> Asbestos*	<input type="checkbox"/> Corrosive	<input type="checkbox"/> Flammable	<input type="checkbox"/> Magnetic Field	<input checked="" type="checkbox"/> Pressurized Systems
<input type="checkbox"/> Beryllium*	<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Fumes/Mist/Dust*	<input type="checkbox"/> Material Handling	<input type="checkbox"/> Rigging/Critical Lift
<input type="checkbox"/> Biohazard*	<input type="checkbox"/> Electrical	<input type="checkbox"/> Heat/Cold Stress*	<input type="checkbox"/> Noise*	<input type="checkbox"/> Toxic Materials*
<input type="checkbox"/> Chemicals*	<input type="checkbox"/> Elevated Work*	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Non-ionizing Radiation	<input type="checkbox"/> Vacuum
	<input type="checkbox"/> Excavation	<input type="checkbox"/> Lasers*	<input type="checkbox"/> Oxygen Deficiency*	<input type="checkbox"/> OTHER _____

\*Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? ☐ Yes ☐ No

**ENVIRONMENTAL CONCERNS** ☐ NONE

<input type="checkbox"/> Atmospheric Discharges (rad/non-rad)	<input type="checkbox"/> Liquid Discharges	<input type="checkbox"/> Soil activation/contamination	<input type="checkbox"/> Waste - Mixed
<input type="checkbox"/> Chemical or Rad Material Storage or Use	<input type="checkbox"/> Oil / PCB Management	<input type="checkbox"/> Waste - Clean	<input type="checkbox"/> Waste - Radioactive
<input type="checkbox"/> Cesspools (UIC)	<input type="checkbox"/> Protected areas / species	<input type="checkbox"/> Waste - Hazardous	<input type="checkbox"/> Waste - Regulated Medical
<input type="checkbox"/> High water / power consumption	<input type="checkbox"/> Spill potential	<input type="checkbox"/> Waste - Industrial	<input type="checkbox"/> OTHER _____

Waste disposition by: \_\_\_\_\_

**POLLUTION PREVENTION (P2) / WASTE MINIMIZATION OPPORTUNITY:** ☐ None ☐ Yes

**Facility Concerns** ☒ NONE

<input type="checkbox"/> Access/Egress Limitations	<input type="checkbox"/> Impacts Facility Use Agreement	<input type="checkbox"/> Temperature Change	<input type="checkbox"/> OTHER _____
<input type="checkbox"/> Configuration Control	<input type="checkbox"/> Maintenance Work on Ventilation Systems	<input type="checkbox"/> Utility Interruptions	
<input type="checkbox"/> Electrical Noise	<input type="checkbox"/> Potential to Cause a False Alarm	<input type="checkbox"/> Vibrations	

**Work Controls**

**WORK PRACTICES** ☒ NONE ☐ Exhaust Ventilation ☐ Lockout/Tagout ☐ Spill Containment  
☐ Back-up Person/Watch ☐ HP Coverage ☐ Posting/Warning Signs ☐ Time Limitation  
☐ Barricades ☐ IH Survey ☐ Scaffolding - requires inspection ☐ Warning alarm (i.e. "high level")

**PROTECTIVE EQUIPMENT** ☐ NONE ☐ Ear Plugs ☐ Gloves ☐ Lab Coat ☒ Safety Glasses  
☐ Coveralls ☐ Ear Muffs ☐ Goggles ☐ Respirator ☐ Safety Harness  
☐ Disposable Clothing ☐ Face Shield ☐ Hard Hat ☐ Shoe covers ☒ Safety Shoes ☐ OTHER \_\_\_\_\_

**PERMITS**

**REQUIRED** ☒ NONE Initial next to box to show who has responsibility to generate the permit. Permits must be valid when job is scheduled.  
(Please attach) ☐ Concrete/Masonry Penetration ☐ Cutting/Welding ☐ Impair Fire Protection Systems  
☐ Confined Space Entry ☐ Digging/Core Drilling ☐ Rad Work Permit - RWP No. \_\_\_\_\_  
☐ Electrical Working Hot ☐ OTHER \_\_\_\_\_

**DOSIMETRY/ MONITORING** ☐ NONE ☐ Heat Stress Monitor ☐ Real Time Monitor ☐ TLD  
☐ Air Effluent ☐ Noise Survey/Dosimeter ☐ Self-reading Pencil Dosimeter ☐ Waste Characterization  
☐ Ground Water ☒ O<sub>2</sub>/Combustible Gas ☐ Self-reading Digital Dosimeter ☐ OTHER \_\_\_\_\_  
☐ Liquid Effluent ☐ Passive Vapor Monitor ☐ Sorbent Tube/Filter Pump

**Training Requirements** (List below any location specific training requirements)

Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below.

ES&H Risk Level: ☒ LOW ☐ MODERATE ☐ HIGH

Complexity Level: ☒ LOW ☐ MODERATE ☐ HIGH

Work Coordination: ☒ LOW ☐ MODERATE ☐ HIGH

Note: If all the ratings are LOW, the Work Control Coordinator and Service Provider must sign for concurrence on the back side. Further review of the work permit is not required. If any ratings are MODERATE or HIGH, the entire permit must be completed.

3. Both work requester and service provider coordinate on work plan (use attachments for detailed plans)

**Work Plan:** (procedures, timing, equipment, and personnel availability need to be addressed)

SEE ATTACHMENT

Special Working Conditions Required: pressurize system with INERT gas and check for leaks before starting

Operational Limits Imposed:

Post Work Testing Required:

Job Safety Analysis Required Yes ☒ No

Walkdown Required Yes ☒ No

**Reviewed By:** Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Other				
Other				
Work Control Coordinator*	Carter Biggs	Carter Biggs	15639	2/25/04
Service Provider*	CARTER Biggs	Carter Biggs	15639	2/25/04

\*Only signatures required for concurrence on LOW rated jobs.

Review done: in series team

4. Job site personnel fills out this section

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including attached permits).

Job Site Supervisor CARTER Biggs Contractor Supervisor

Workers: CARTER Biggs Life # 15639 Workers: Life #

Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.

5. Work Requester or designee fills out this section

**Conditions are Appropriate to Start Work:** (Work permit has been reviewed, work controls are in place, and site is ready for job.)

Name CARTER Biggs Signature Carter Biggs Life # 15639 Date 2/26/04

6. Work Requester determines if Post Job Review is required No Yes (Fill in names of reviewers)

**Post Job Review:**

Name: Signature Life #: Date:

Name: Signature Life #: Date:

7. Worker provides feedback

**Worker Feedback:**

8. Work Control Coordinator (requesting dept.) checks quality of completed permit and closes out

Closeout: Name CARTER Biggs Signature Carter Biggs Life #: 15639 Date: 2/27/04

Comments:

## **Work Plan For Creating A Specialty Gas Mix Of 45% Helium, 45% Xenon, And 10% Methane**

1. Modify an existing 3000 psi rated, 6 spigot P-10 manifold to accommodate two CGA-580 cylinders, one precision pressure gauge, and one 1/2" vacuum port, while leaving two CGA-350 fittings.
2. Secure one empty P-10 cylinder, one Methane cylinder, one Helium cylinder, one Xenon cylinder, the pressure gauge , and the vacuum pump within reach of the manifold and connect them to their respective ports.
3. Evacuate the system to make sure the mix is "clean".
4. Start the mix by filling the empty P-10 cylinder with the Xenon until the pressure reaches 450 PSIG.
5. Close the Xenon and open the Helium cylinder and continue to fill the P-10 (Mix) cylinder until the pressure reaches 900 PSIG.
6. Close the Helium and open the Methane and fill the Mix cylinder until the pressure reaches 1000 PSIG.
7. Close off all valves to the cylinders and disconnect them from the manifold. Return all cylinders to their respective storage locations.